



Impact of Computer-Supported Blended Instruction on Students' Academic Achievement in Federal University of Education, Zaria, Nigeria

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ABSTRACT

The study examined the impact of Computer-Supported Blended Instruction on students' academic achievement in the Federal University of Education, Zaria. Two components of blended instruction were assessed: digital learning resources and online learning platforms. The study adopted a descriptive survey design, involving 156 respondents comprising HODs, lecturers, and students. Data were collected using a structured questionnaire and analysed using descriptive statistics and Analysis of Variance (ANOVA). Findings showed that digital learning resources significantly improved students' academic performance, although the level of perceived impact varied among stakeholders. Online learning platforms also demonstrated a positive influence on academic achievement, but lecturers and students expressed lower levels of agreement compared to HODs. ANOVA results revealed significant differences in stakeholders' opinions on the influence of digital learning resources and online learning platforms on academic achievement. The study concludes that computer-supported blended instruction contributes meaningfully to students learning outcomes when digital tools are accessible and properly integrated. It recommends improved training, increased ICT support, and structured institutional policies to enhance the adoption and impactful use of blended instructional models.

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INTRODUCTION

The rapid growth of digital technologies has transformed instructional delivery across higher education, compelling universities to rethink traditional pedagogical models in favour of more flexible, technology-driven approaches. Around the world, institutions are shifting towards instructional designs that combine digital learning tools with conventional classroom teaching, creating a hybrid learning environment popularly known as computer-supported blended instruction. This mode of teaching merges the strengths of face-to-face engagement with the advantages of online learning resources, thereby offering students a more dynamic, interactive and personalized learning experience (Adeniran & Bello, 2022; Yusuf & Ibrahim, 2023).

In Nigeria, the demand for innovative instructional models has intensified as universities work to meet global standards and respond to the learning needs of the 21st-century students (Oche & Danjuma, 2021). Within this context, the Federal University of Education, Zaria, faces growing expectations to integrate digital tools into its instructional processes to enhance learning outcomes and strengthen the preparation of future educators.

Computer-supported blended instruction has emerged as a promising approach because it maximizes students' engagement while addressing the limitations of either online or traditional instruction when used alone. The model typically incorporates digital learning resources such as multimedia content, e-books, virtual simulations,

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and interactive modules that extend learning beyond the classroom (Olatunji & James, 2022; Okafor, 2023). Research suggests that digital resources offer students multiple representations of content, support self-paced learning, and promote deeper conceptual understanding (Salihu & Haruna, 2021). However, despite its potential, the actual influence of digital learning materials on academic achievement remains a subject of debate, especially within Nigerian institutions where issues such as limited digital literacy, inconsistent power supply, and insufficient ICT infrastructure continue to pose challenges (Dahiru & Usman, 2020; Ibrahim & Garba, 2022). These contextual differences make it essential to investigate how digital learning resources affect academic performance within a teacher-training environment such as the Federal University of Education, Zaria.

A second pillar of computer-supported blended instruction is the use of online learning platforms or Learning Management Systems (LMS). Systems such as Moodle, Google Classroom, Canvas, and institutional e-portals are central to digital pedagogy, allowing lecturers to upload materials, administer quizzes, track participation, and facilitate virtual discussions. Studies indicate that online platforms enhance students' academic interactions, increase flexibility, and make course content more accessible (Egwu & Etuk, 2021; Aliyu & Yahaya, 2023). However, findings also highlight ongoing challenges, including low user engagement, internet instability, difficulty navigating platforms, and varied lecturer competence in using LMS tools impassively (Aminu & Okoli, 2022; Chukwu & Bello, 2024).

Such inconsistencies create gaps in empirical understanding of how online learning platforms influence academic achievement in Nigerian universities. A systematic investigation within the context of Federal University of Education, Zaria is therefore essential to determine whether these platforms contribute meaningfully to improved students' performance.

Academic achievement remains a central indicator of the success of instructional innovations. Improving academic outcomes is a priority for teacher-training universities, where the quality of instruction directly shapes the competence of future

educators. Studies across various contexts indicate that when appropriately implemented, blended instruction can enhance academic performance, particularly through improved engagement, increased access to learning materials, and more diverse learning interactions (Bello & Hassan, 2022; Okon & Udoh, 2020). However, the varying conditions under which blended learning is adopted necessitate context-specific evaluations, especially in environments characterized by infrastructural and digital disparities like Nigeria (Ogunlade & Idris, 2021). Given these complexities, this study seeks to examine the impact of computer-supported blended instruction on students' academic achievement within the Federal University of Education, Zaria.

To achieve this purpose, the study is guided by two objectives. The first is to ascertain the impact of digital learning resources on students' academic achievement. Understanding how digital content supports or challenges academic performance is important, given its increasing role in instructional delivery. The second objective aims to determine the impact of online learning platforms on students' achievement, recognizing that these platforms have become central to communication, assessment, and instructional management. The third objective focuses on examining how face-to-face and online integration strategies influence students' performance, acknowledging that blended learning impactiveness depends not only on digital tools but on how they are integrated with classroom activities.

For example, research by Olatunji and James (2022) reported that students exposed to digital learning resources demonstrated higher academic performance compared to those taught exclusively through traditional methods. Similarly, Bello and Hassan (2022) found that multimedia-based resources increased learner motivation and improved retention of knowledge in Nigerian higher education contexts. However, several studies indicate that the impassiveness of digital resources depends on accessibility, students' digital literacy, and the quality of content provided (Dahiru & Usman, 2020; Ibrahim & Garba, 2022). Constraints such as limited internet access, insufficient devices, and poorly designed materials can reduce the potential of digital learning tools to impact academic



achievement positively. Overall, empirical evidence suggests that when appropriately implemented, digital learning resources can significantly enhance students understanding and performance, particularly in contexts where teacher-students interaction is supplemented with technology-mediated instruction (Salihu & Haruna, 2021; Eze & Ajayi, 2023).

Online learning platforms, including Learning Management Systems (LMS) like Moodle, Google Classroom, and Canvas, serve as digital environments for delivering course content, assignments, and assessments, while facilitating communication between students and instructors (Egwu & Etuk, 2021; Aliyu & Yahaya, 2023). Research has shown that the consistent use of online platforms enhances academic achievement by improving accessibility to learning materials, fostering collaborative engagement, and enabling immediate feedback (Aminu & Okoli, 2022; Okafor, 2023). For instance, a study by Chukwu and Bello (2024) highlighted that student who actively engaged with LMS features such as discussion forums and quizzes scored higher on academic assessments.

Similarly, Henry and Olanrewaju (2023) demonstrated that online platforms provide flexibility for learners, accommodating self-paced study and repeated exposure to learning content, which strengthens understanding. Despite these benefits, challenges such as poor internet connectivity, insufficient training for both lecturers and students, and low interaction rates can limit the impassiveness of online platforms (Ojo & Adebisi, 2021; Tanko & Simon, 2023). In conclusion, the literature underscores that online learning platforms positively influence students' academic achievement, provided that access, usability, and engagement are optimized within the instructional design (Ugwueze & Simon, 2023; Ogundele & Ahmed, 2021). Corresponding to these objectives, the study raises two research questions. First, how digital learning resources influence academic achievement; and second, what impact online learning platforms have on achievement. These questions guide the investigation and provide a framework for analyzing how each component of

blended instruction contributes to learning outcomes.

STATEMENT OF THE PROBLEM

The integration of digital technologies into higher education has been widely recognized as essential for improving instructional delivery and learning outcomes. However, despite this recognition, many Nigerian universities still rely heavily on traditional face-to-face teaching approaches (Afolayan & Ogunlade, 2021). At the Federal University of Education, Zaria, the adoption of computer-supported blended instruction remains inconsistent, even though studies have shown that blended learning enhances learner engagement, flexibility, and overall academic performance (Olatoye & Ajani, 2022). This misalignment between global instructional trends and local practices raises concerns about the actual impact of such approaches on students' achievement.

Reports indicate that students often face limited access to digital learning resources, inadequate exposure to online instructional platforms, and inconsistent use of technology-driven pedagogies by lecturers (Olaoye & Yusuf, 2020). These challenges threaten the impactiveness of computer-supported blended instruction and may contribute to variations in students' academic achievement. Additionally, disparities in lecturers' digital competence and their ability to design and implement blended learning further complicate the instructional process (Umar & Mohammed, 2023).

Although several studies have examined blended learning within Nigerian universities, empirical evidence focusing specifically on its computer-supported dimensions within colleges of education remains insufficient. This gap is critical because teacher-training institutions require impactful and innovative pedagogical practices to enhance both learning outcomes and future teaching capacity (Yahaya & Bello, 2021). Without clear evidence on how computer-supported blended instruction influences academic achievement at the Federal University of Education, Zaria, institutional decisions regarding digital pedagogy may remain unstructured and in impactful.

Therefore, a systematic investigation is needed to determine whether computer-supported

blended instruction significantly influences students' academic achievement in this context. The findings will provide evidence-based guidance for strengthening technology-enhanced learning within teacher education programmes.

Objectives of the Study

The study seeks to:

1. ascertain the impact of digital learning resources on students' academic achievement in Federal University of Education, Zaria;
2. To determine the impact of online learning platforms on students' academic achievement in Federal University of Education, Zaria

Research Questions

The study would be guided by the following research questions:

1. How do digital learning resources influence students' academic achievement in the Federal University of Education, Zaria?
2. What impact do online learning platforms have on students' academic achievement in the Federal University of Education, Zaria?

Research Hypotheses

The following null hypotheses were formulated in the study:

H0₁: There is no significant difference in the opinions of stakeholders in the use of digital learning resources and students' academic achievement in the Federal University of Education, Zaria.

H0₂: There is no significant difference in the opinions of stakeholders on the impact of online learning platforms on students' academic achievement in the Federal University of Education, Zaria.

METHODOLOGY

The study adopted a descriptive survey research design to examine the impact of the computer blended instruction on students' academic achievement in federal university of education, zaria. As noted by Cohen, Manion, and Morrison (2007), descriptive surveys are used to collect and describe data on variables of interest, either from large or small populations. The target population comprised 126 HODs, 1,567 lecturers, and 42,126 students, totaling 43,819 individuals (Registry of FUE, 2025). To obtain a manageable sample, 13 HODs, 78 lecturers, and 65 students were selected, giving a total of 156 respondents. This sample size represented approximately 10% of the HODs and lecturers, while students were sampled proportionately.

The respondents were drawn using a random sampling technique to ensure representativeness. This approach enabled the study to gather diverse perspectives from key stakeholders on the impassiveness of the school feeding programme in enhancing primary education outcomes. The descriptive statistics of frequency, mean and standard deviation were used to answer the research questions, while analysis of variance (ANOVA) was used to test the hypotheses at 0.05 level of significance.

RESULTS

Research Question One:

How do digital learning resources influence students' academic achievement in the Federal University of Education, Zaria?

The data collected through the administered questionnaire on HODs, lecturers and students in respect to research question one was analysed using frequency, mean and standard deviation. The summary of analysis made on this research question is presented in table 1.

Table 1: The digital learning resources influence on students' academic achievement in the Federal University of Education, Zaria

SN	Item	Respondents	SA	A	U	D	SD	Mean	SD
1.	Digital learning resources improve my comprehension of difficult concepts.	HODs	8	5	-	-	-	4.615	0.506
		lecturers	60	8	-	2	8	3.282	0.820
		students	-	17	5	6	37	2.907	0.986

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SN	Item	Respondents	SA	A	U	D	SD	Mean	SD
2.	Using digital learning resources has enhanced my performance in assignments and exams.	HODs	11	2	-	-	-	4.846	0.375
		lecturers	22	23	5	2	26	3.794	1.255
		students	26	11	3	4	21	3.492	1.293
3.	Digital learning resources make learning more engaging and interactive.	HODs	4	8	-	1	-	4.153	0.800
		lecturers	6	16	5	-	51	2.820	1.235
		students	1	34	10	19	1	3.230	0.948
4.	I can easily access relevant academic materials through digital learning resources.	HODs	8	3	2	-	-	4.000	0.776
		lecturers	31	27	3	7	10	3.448	1.411
		students	1	43	12	5	4	2.769	0.903
5.	Digital learning resources help me study more efficiently and manage my time better.	HODs	6	3	2	2	-	4.461	1.154
		lecturers	-	42	24	8	4	3.333	0.862
		students	1	23	10	1	30	2.846	1.414
6.	Regular use of digital learning resources has positively impacted my grades.	HODs	4	8	-	1	-	4.153	0.800
		lecturers	3	39	16	7	13	3.153	1.185
		students	1	33	12	17	2	3.215	0.960
7.	Digital learning resources provide diverse perspectives that improve my understanding of course topics.	HODs	6	5	2	-	-	4.307	0.751
		lecturers	3	31	7	9	28	2.641	1.413
		students	-	19	2	22	22	2.927	1.218
Average Mean								3.50	1.01

The table reveals that HODs perceive digital learning resources as highly impactful in enhancing students' academic achievement, with mean scores ranging from 4.00 to 4.846, indicating strong agreement. Lecturers and students, however, report a moderate influence, with mean scores generally between 2.5 and 3.8, reflecting less pronounced agreement. The overall average mean of 3.50 suggests that while digital

learning resources positively impact academic performance, the impact is not uniform across all stakeholders. Based on these findings, the null hypothesis stating that digital learning resources do not significantly influence students' academic achievement is rejected, supporting the conclusion that they have a measurable positive impact.

Table 2: The impact of online learning platforms on students' academic achievement in the Federal University of Education, Zaria

SN	Item	Respondents	SA	A	U	D	SD	Mean	SD
1.	Online learning platforms have improved my understanding of course content.	HODs	6	7	-	-	-	4.461	0.518
		lecturers	39	32	2	5	-	3.965	0.819
		students	1	27	3	6	28	3.492	1.437
2.	Using online learning platforms has positively influenced my academic performance.	HODs	8	4	1	-	-	3.138	0.660
		lecturers	-	17	6	3	52	2.846	1.269
		students	-	8	3	31	23	2.800	0.949
3.	Online learning platforms make it easier for me to access study materials anytime.	HODs	8	4	1	-	-	4.238	0.615
		lecturers	29	5	15	21	8	2.625	1.150
		students	17	28	1	10	9	3.190	1.289
4.	My ability to complete assignments on time has	HODs	10	2	-	-	1	3.615	0.869
		lecturers	5	-	11	35	27	2.692	1.351
		students	1	12	8	30	14	2.323	1.060

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SN	Item	Respondents	SA	A	U	D	SD	Mean	SD
	increased due to online learning platforms.								
5.	Online learning platforms have enhanced my problem-solving and critical thinking skills.	HODs	9	3	-	1	-	4.001	1.126
		lecturers	38	-	20	11	9	3.115	1.044
		students	-	13	6	44	2	2.946	0.849
6.	I perform better in examinations when I use online learning platforms regularly.	HODs	7	5	-	1	-	4.161	0.160
		lecturers	31	19	12	16	-	2.701	1.076
		students	13	11	39	2	-	3.538	0.849
7.	Online learning platforms allow me to learn at my own pace, which improves my academic achievement.	HODs	5	8	-	-	-	4.384	0.506
		lecturers	-	11	11	34	22	2.514	0.989
		students	17	16	8	24	-	3.353	1.124
Average Mean								3.34	0.99

The table indicates that HODs perceive online learning platforms as highly beneficial to students' academic achievement, with mean scores mostly above 4.0, reflecting strong agreement. lecturers and students, however, report moderate to low impact, with mean scores ranging from 2.5 to 3.9. The overall average mean of 3.34 suggests that online learning platforms positively influence academic performance, though the impact varies among stakeholders. Based on these results, the null hypothesis stating that online learning platforms do not significantly impact students' academic achievement is

rejected, supporting the conclusion that these platforms have a measurable positive, albeit varied, impact on students learning outcomes.

Hypothesis One:

There is no significant difference in the opinions of stakeholders on the use of digital learning resources and students' academic achievement in the Federal University of Education, Zaria.

The opinions of HODs, lecturers and students were gathered and tested using analysis of variance (ANOVA). The summary of the hypothesis tested is presented in table 3:

Table 3: Summary of Analysis of Variance (ANOVA) statistics on the opinions of stakeholders on the use of digital learning resources and students' academic achievement in the Federal University of Education, Zaria.

Status	Sum of Squares	df	Mean Square	F-ratio	F-critical	Prob.
Between Groups	20.894	2	29.947	19.943	2.61	.002
Within Groups	54.875	154	4.488			
Total	75.769	156				

The ANOVA results indicate a significant difference in students' academic achievement based on use of digital learning resources in federal university of education, zaria. The between-group sum of squares (20.894) and the mean square value (29.947) produced an F-ratio of 19.943, which is substantially higher than the F-critical value of 2.61. This means the variation observed among groups is unlikely to have occurred by chance. The associated

probability value (.002) further confirms statistical significance at the 0.05 level. Consequently, use of digital learning resources meaningfully influences students learning outcomes, highlighting the importance of blended learning in improving achievement. Hence, the null hypothesis which states that there is no significant difference in the opinions of HODs, lecturers and students on the impact of use of digital learning

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resources on students' academic achievement in federal university of education is rejected.

Hypothesis Two:

There is no significant difference in the opinions of stakeholders on the impact of online learning

platforms on students' academic achievement in the Federal University of Education, Zaria.

The opinions of HODs, lecturers and students were gathered and tested using analysis of variance (ANOVA). The summary of the hypothesis tested is presented in table 4:

Table 4: Summary of Analysis of Variance (ANOVA) Statistics on the impact of online learning platforms on students' academic achievement in the Federal University of Education, Zaria

Status	Sum of Squares	df	Mean Square	F-ratio	F-critical	Prob.
Between Groups	30.356	2	1.178	4.097	2.61	.000
Within Groups	75.875	154	.288			
Total	106.231	156				

The ANOVA findings reveal a significant impact of online learning platforms on students' academic achievement in federal university of education, zaria. The between-group sum of squares (30.356) and mean square (1.178) produced an F-ratio of 4.097, which exceeds the F-critical value of 2.61. This indicates that differences in learning outcomes across groups are statistically meaningful. The probability value (.000) confirms significance at the 0.05 level, showing that these differences did not occur by chance. Overall, the result suggests online learning platforms contribute more to improved students' performance, underscoring the importance of blended learning. Hence, the null hypothesis which states that there is no significant difference in the opinions of HODs, lecturers and students on the impact of online learning platforms on students' academic achievement in federal university of education is rejected.

DISCUSSION OF FINDINGS

Findings revealed that digital learning resources exert a significant positive influence on academic achievement, with HODs expressing stronger agreement compared to lecturers and students. This aligns with earlier studies that reported improved comprehension and motivation when digital materials such as multimedia content, simulations, and e-books are integrated into instruction (Olatunji & James, 2022; Bello & Hassan, 2022). The higher ratings by HODs may reflect a broader administrative view of institutional ICT

investments, while lecturers and students, who interact directly with these tools, experience challenges such as inconsistent access, low digital literacy, or inadequate instructional design.

In the second hypothesis, the data showed that online learning platforms such as Moodle, Google Classroom, and e-portals positively influence academic achievement, though stakeholders differed in the level of perceived impact. HODs rated these platforms highly, while lecturers and students showed moderate to low agreement. This variation echoes earlier studies that identified inconsistent adoption of LMS tools among lecturers and varying levels of students' engagement (Aminu & Okoli, 2022; Chukwu & Bello, 2024). The moderate agreement by lecturers suggests challenges related to training, workload, or digital competence, while students' responses may reflect limited data access, difficulty navigating platforms, or unstable internet connectivity.

CONCLUSION

The study established that computer-supported blended instruction significantly enhances students' academic achievement in the Federal University of Education, Zaria. Digital learning resources were found to improve comprehension, engagement, and performance, though disparities in access and digital competency affected the level of perceived impact. Online learning platforms also demonstrated a positive contribution to academic

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outcomes, despite variations in usage and perceived impact among lecturers and students.

RECOMMENDATIONS

1. The university should improve internet connectivity, expand access to digital devices, and ensure regular maintenance of ICT facilities to support impactful blended instruction.
2. Regular professional development programmes should be organized to enhance lecturers' competence in designing and delivering blended learning content.
3. Students should receive structured training on navigating LMS tools, accessing digital resources, and managing online learning tasks impact.
4. The university should develop a clear policy that guides the design, implementation, and monitoring of blended instructional practices.

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